

ABSTRACT

[Abstract of the Disclosure]

An apparatus and method for transcopying data, in which original content data is transcopied into a different coding system. The data transcopying apparatus has a coding method confirming unit for confirming a coding method applied to original content data; a transcopying unit for generating copied content data by converting the original content data so that the copied content data can be decoded by a second coding method, which is different from the coding method of the original content data; and a management information recording unit for recording information indicating that the original content data is copied in a management information area on the original content data, and recording information indicating that the copied content data is transcopied from the original content data in a management information area on the copied content data. When content data is encoded by a method and the player or decoder of a user cannot decode the content data encoded by the method, the data transcopying apparatus enables to reproduce the encoded content data in the player of the user by changing the coding method, and controls right information so that copyright of the content data is not infringed by the transcopying. By doing so, the data transcopying apparatus protects the right of the content data provider and the user can enjoy the content data in the most convenient way.

[Representative Drawing]

FIG. 1

[Key Words]

contents (content data), convert and copy, right management

SPECIFICATION

[Title of the Invention]

APPARATUS AND METHOD FOR TRANSCOPYING DATA

[Brief Description of the Drawings]

5 FIG. 1 is a block diagram of a data transcopying apparatus according to a preferred embodiment of the present invention;

 FIG. 2 is an example of information contained in original content data or copied content data;

10 FIGS. 3A and 3B are diagrams to explain a transcopying unit shown in FIG. 1 in more detail, and FIG. 3A shows an example, in which when content data is music data the coding method of the original content data is different from the coding method of a player, and FIG. 3B is a detailed block diagram of the transcopying unit shown in FIG. 1;

 FIG. 4 is a detailed block diagram of a reverting unit shown in FIG. 1;

15 FIG. 5 is an example of receiving content data through a communications network, such as the Internet, and using the content data;

 FIG. 6 is a flowchart of a method for transcopying data according to a preferred embodiment of the present invention; and

20 FIG. 7 is a flowchart of a method for reverting copied content data, which is transcopied by the method shown in FIG. 6, into the original content data.

[Detailed Description of the Invention]

[Object of the Invention]

[Technical field of the Invention and Related Art prior to the Invention]

25 The present invention relates to converting data, and more particularly, to an apparatus and method for converting data into a different coding system to generate converted data and copying the converted data instead of the original data (hereinafter referred to as "transcopying data").

 When a person buys music or video data on the Internet, the buyer receives data, to which a coding method of a seller is applied, without change. If the buyer

has a decoder capable of reproducing the data, there is no problem. However, if the buyer's decoder is incapable of reproducing the data, the buyer cannot enjoy the data.

[Technical goal of the Invention]

5 To solve the above problems, it is a first objective of the present invention to provide an apparatus and method for transcopying data, in which original content data is transcopied and provided so that the original content data can be decoded by a different coding method in case that the decoder of a user's player uses a coding method different from the coding method of the original contents.

10 It is a second objective to provide a content data structure containing right information such as copyright when the content data is transcopied.

[Structure and Operation of the Invention]

To accomplish the first objective of the present invention, there is provided an apparatus has a coding method confirming unit for confirming a coding method
15 applied to original content data; a transcopying unit for generating copied content data by converting the original content data so that the copied content data can be decoded by a second coding method, which is different from the coding method of the original content data; and a management information recording unit for recording information indicating that the original content data is copied in management
20 information area on the original content data, and recording information indicating that the copied content data is transcopied from the original content data in management information area on the copied content data.

It is preferable that the transcopying unit has a decoding unit for decoding original content data according to the coding method of the original content data;
25 and an encoding unit for generating copied content data by encoding the decoded content data by the second coding method, which is applied to the copied content data.

Also, it is preferable that the transcopying unit has a reverting unit for restoring the original content data from the copied content data, by recording
30 information indicating that right information is restored from the copied content data, in a management information area on the original content data, after confirming

whether or not the copied content data is transcopied from the corresponding original content data.

To accomplish the first objective of the present invention, there is provided a method for transcopying data has the steps of (a) confirming a coding method
5 applied to original content data; (b) setting a second coding method that is different from the coding method applied to the original content data; and (c) generating copied content data which can be decoded by the second coding method, by converting the original content data.

It is preferable that, when reverting the copied content data to the original
10 content data, the method for transcopying data further has steps of confirming whether or not the copied content data is transcopied from the original content data; and recording information indicating that right information is restored from the copied content data which is transcopied from the original content data, in a management information area on the original content data.

To accomplish the second objective of the present invention, there is
15 provided a content data structure having content data; data file information which is uniquely provided to the content data so that the content data can be distinguished from other content data; and a right management information area in which information on whether the content data is original content data or copied content
20 data transcopied from original content data, and right information related to data transcopying are recorded. In the content data structure, information on the corresponding original content data is recorded in the data file information area of copied content data, and management information for the original content data and the copied content data changes according to transcopying situations.

It is preferable that the management information includes at the minimum one
25 of information on the number to which data is allowed to be copied, information for distinguishing the original content data from the copied content data, and information on coding methods of content data.

Hereinafter converting data into a different coding system and copying the
30 converted data will be referred to as "transcopying data".

In FIG. 1, which is a block diagram of a data transcopying apparatus according to a preferred embodiment of the present invention, a content player 17

means a device, with which a user directly reproduces content data, for example, an audio player. The content player 17 can be any player for video or other types of data that can be reproduced in a player. The data transcopying apparatus according to the present invention can be regarded as an apparatus for providing data appropriate to the content player 17, and can be generally installed in a personal computer or in a server for providing data. The content player 17 may be a device that is separate from a computer, for example, a digital television, or may be implemented in a computer as hardware or software. In the present invention, the data transcopying apparatus and the content player may be physically separated or combined.

The data transcopying apparatus 13 has a transcopying unit 131 for transcopying original content data 11 to copied content data 15, and a reverting unit 135 for reverting the copied content data 11 to the original content data 15.

The transcopying unit 131 receives the original content data 11, which may be stored in a memory or a disc in advance, or may be online transmitted through a communications network. The copied content data 15, which is transcopied in the transcopying unit 131, is encoded by a method appropriate for the player 17 of the user.

The original content data 11 contains a data file on the content data and right management information related to copyrights, and likewise the copied content data 15 contains a data file on the transcopied content data and right management information related to copyrights. The right management information may include information on right contents related to copyrights or licenses of the content data, and information directly or indirectly related to the right contents, for example, the date when the copyright came into effect, the dates when the content data is used, and the number of using the content data. Also, the right management information may include information for ordinary data management, such as the file size and the date of generation.

FIG. 2 is an example of information contained in the original content data 11 or the copied content data 15. Contained information includes data file information 21, which is uniquely assigned to the content data so that the content data can be

distinguished from other content data and right management information 25, which includes right information, such as copyrights of the content data.

As data file information 21, the producer, seller, or copyright holder of the content data is recorded, or unique code information of the content data is recorded.

5 For example, information on the nationality of the copyright holder 211, a registered person 212, authoring year 213, and unique code 214 can be included.

As right management information 25, right information related to transcopying, including information on the number to which data is allowed to be copied 251, information for distinguishing the original content data from the copied content data 10 252, and information on coding methods of content data 253, is included.

The original content data and the copied content data thereof may confirm the identity of both content data, by commonly sharing data file information. Also, the copied content data can prepare separate information so that the relation of the copied content data and the original content data can be confirmed later.

15 FIGS. 3A and 3B are diagrams to explain a transcopying unit 131 shown in FIG. 1 in more detail. FIG. 3A shows an example, in which, for example, when content data is music data, the coding method of the original content data is different from the coding method of a player. In FIG. 3A, the encoding method 31 of the original content data is an MP3 method, while the decoding method 32 of the player is an AAC method. The encoding method applied to the original content data 20 or the decoding method of the player can be found using hardware or software, or the user can directly input the decoding method. Normally, the encoding method of the original content data is found by analyzing the content data, and the decoding method of the player is selected by user's input.

25 FIG. 3B is a detailed block diagram of the transcopying unit shown in FIG. 1, and shows an example in which MP3-type original content data 33 is transcopied into AAC-type copied content data 38.

30 An encoding method confirming unit 34 confirms a coding method applied to the original content data 33, by analyzing the structure of the content data. When the content provider informs the coding method, the user can set a coding method without separately confirming the coding method.

A decoder unit 35 has various kinds of decoders, for example, an MP3 decoder 351, an AAC decoder 352, an AC3 decoder 353, etc. , when content data is music data. The decoder unit 35 selects a decoder corresponding to the coding method of the original content data 33, decodes the original content data 33, and
5 outputs the decoded data as standard data 36. Here, the standard data 36 may be data which is reproduced by the original content data, or data encoded by a predetermined coding method.

An encoder unit 37 also has various kinds of encoders, for example, an MP3 encoder 371, an AAC encoder 372, an AC3 encoder, etc., when content data is
10 music data. The encoder unit 37 selects an encoder corresponding to a decoding method set for the player, converts the standard data 36, and generates copied content data 38.

A control unit for right management information 39 changes right management information of the original content data 33 and the copied content data
15 38 according to a transcoding situation. For example, right management information on the original content data 33 includes copy information indicating that the original content data is copied to the copied content data. The copy information may further includes information indicating whether the original content data is copied or transcopied, or information on the copying frequency and copying date.
20 The right management information on the copied content data includes information indicating that the copied content data is transcopied from the original content data.

FIG. 4 is a detailed block diagram of a reverting unit 135 shown in FIG. 1. The reverting unit 135 reverts the copied content data 41 into the corresponding original content data 44.

An original content data confirming unit 42 confirms the original content data corresponding to the copied content data, using information that can confirm original content data, such as data file information in the copied content data 41. Here, the sets of original content data 44 may be content data stored in a storage means,
25 such as a hard disc or a compact disc of the user computer, or content data stored in a server for providing content data through a communications network, such as the Internet.
30

If the original content data corresponding to the copied content data is confirmed, the right management information control unit 43 restores the original content data from the copied content data and information indicating that right information is restored from the transcoped content data is recorded in the right management information area of the original content data. Also, information indicating that the copied content data is restored to the original content data is recorded in the right management information area of the copied content data, or the content of the right management information is changed so that the copied content data cannot be used. Unlike the transcopying process, a reverting process does not need a data converting process and only right information is restored.

FIG. 5 is an example of receiving content data through a communications network 52, such as the Internet, and using the content data. A content data provider 51 provides original content data which is coded by a coding method selected by the content data provider 51. A content data user 53 receives the original content data through the communications network 52. If a player 54 of the user supports the coding method of the original content data, the user can directly reproduce the content data. If the player 54 does not support the coding method of the original content data, a transcopying process is needed. Software (or hardware, if necessary) for transcopying may be provided by the content data provider 51 or the user 53 may prepare the software.

The content data user 53 confirms the coding method of the original content data before or after the original content data is provided, and can get copied content data coded appropriately to the player 54. At this time, the content data provider 51 may directly provide the original content data to the content data user 53, that is, the user computer 53 may download all the original content data from the content data provider 51 and store the original content data in the user computer 53. On the other hand, the content data provider 51 may provide copied content data with or without the original content data after generating copied content data according to the original content data and its coding method selected by the user 53.

If the user's player 54 is installed in the user computer 53, the downloaded content data can be directly reproduced. If the user's player 54 is separated from the user computer 53, the copied content data is downloaded to the user player 54

and reproduced. If the user 53 desires to restore the original content data from the copied content data, the user 53 can restore the content of rights by changing right management information in each content data. Therefore, by changing right management information of content data according to transcopying or reverting, the content data provider's loss due to copyright infringement can also be prevented.

FIG. 6 is a flowchart of a method for transcopying data according to a preferred embodiment of the present invention. First, original content data, which is provided through a communications network or is stored in a user computer, is input in step 61. The coding method applied to the original content data is confirmed in step 62. A coding method of a player, by which the original content data is desired to be reproduced, is set, that is, the coding method of copied content data is set in step 63. If it is determined in step 64 that the coding method of the player is different from the coding method of the original content, copied content data is generated by converting the coding method of the original content data in step 65. With transcopying data, information indicating that the original content data is transcopied to copied content data is recorded in a right management information area on the original content data, and information indicating that the copied content data is transcopied from the original content data is recorded in a right management information area on the copied content data in step 66.

FIG. 7 is a flowchart of a method for reverting (restoring) copied content data, which is transcopied by the method shown in FIG. 6, into the original content data. Content data which is the object of reverting is input in step 71. It is determined whether or not input content data is copied content data in step 72. The content data may be stored in a memory or a disc of a user computer. Also, the content data may be downloaded from a player to the computer, or may be used by connecting a signal line between the player and the computer. If the content data is copied content data in step 73, the original content data corresponding to the copied content data is found and information indicating that right information is restored from the copied content data, which is transcopied from the original content data, is recorded in the right management information area on the original content data in step 74.

Although detailed explanation is not given in FIGS. 6 and 7, more detailed data transcopying method can be understood by a person skilled in the art, based on the explanation of FIGS. 1 through 5. For example, original content data can be provided through an online communications network, such as the Internet, or the transcopying process is performed by a content data provider or a content data user. Also, right management information may be implemented in various ways during a transcopying process or a reverting process.

Although music data is explained as an embodiment of the present invention, the present invention can be applied to still picture or moving picture data. For example, transcopying functions for still picture data, various types of data (GIF, JPG, TIF, etc.) can be provided. In addition to audio/video data, the present invention can be applied to all types of data that a user can use by decoding the data according to a coding method corresponding to the coding method of content data.

The present invention may be embodied in a code, which can be read by a computer, on a computer readable recording medium. The computer readable recording medium may be any kind on which computer readable data are stored. The computer readable recording media may be storage media such as magnetic storage media (e.g., ROM's, floppy disks, hard disks, etc.), optically readable media (e.g., CD-ROMs, DVDs, etc.), or carrier waves (e.g., transmissions over the Internet). Also, the computer readable recording media can be scattered on computer systems connected through a network and can store and execute a computer readable code in a distributed mode.

[Effect of the Invention]

As described above, the apparatus and method for transcopying data of the present invention enables to reproduce content data in a user's player by changing the coding method of the content data when the content data provided by, or purchased from a content data provider through a communications network, such as the Internet, is encoded by a coding method which the user's player does not support. At the same time, by transcopying data, right management information is controlled so that the copyrights on the content data is not infringed. Therefore, the

FIG. 1

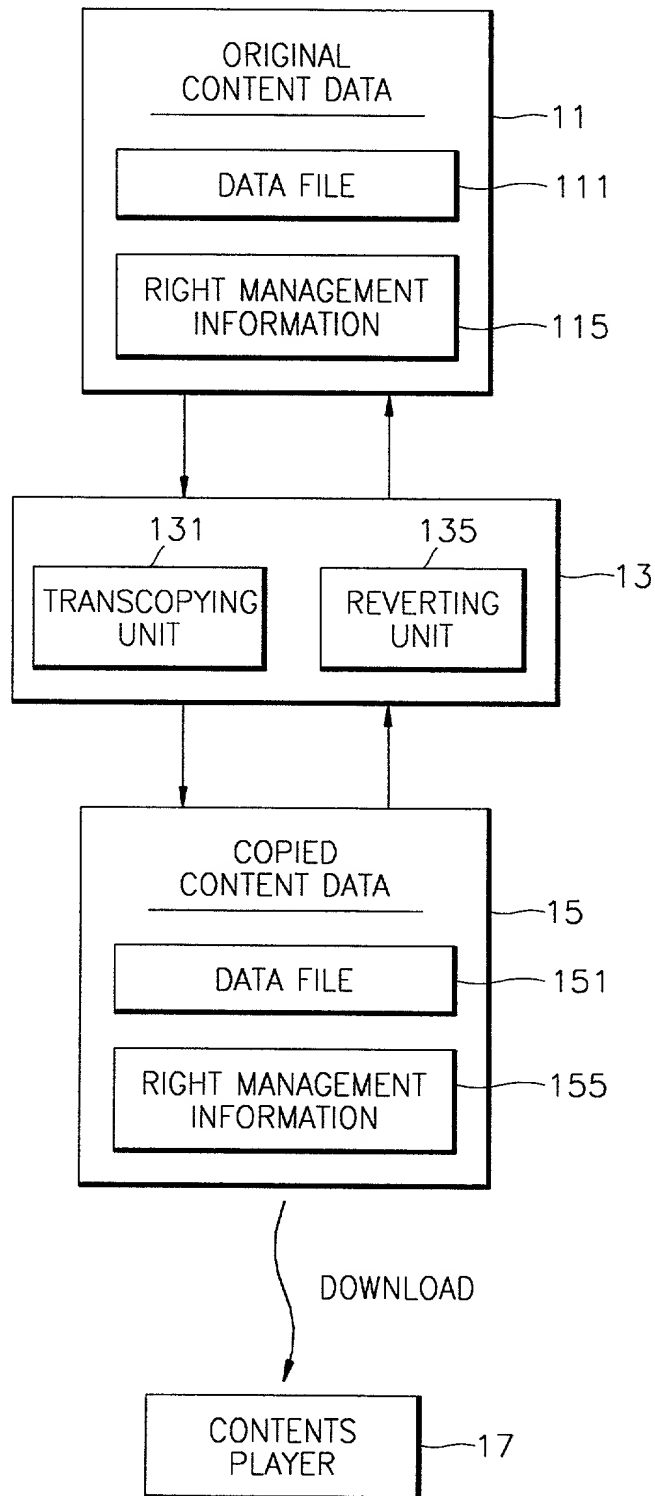


FIG. 2

CLASSIFICATION		CONTENT	
21	DATA FILE INFORMATION	NATIONALITY	211
		REGISTERED PERSON	212
		YEAR	213
		CODE	214
		⋮	
25	RIGHT MANAGEMENT INFORMATION	INFORMATION ON NUMBER OF ALLOWED COPY	251
		INFORMATION FOR DISTINGUISHING ORIGINAL DATA FROM COPIED DATA	252
		INFORMATION ON DECODING METHOD	253
		⋮	

FIG. 3A

FIG. 3A

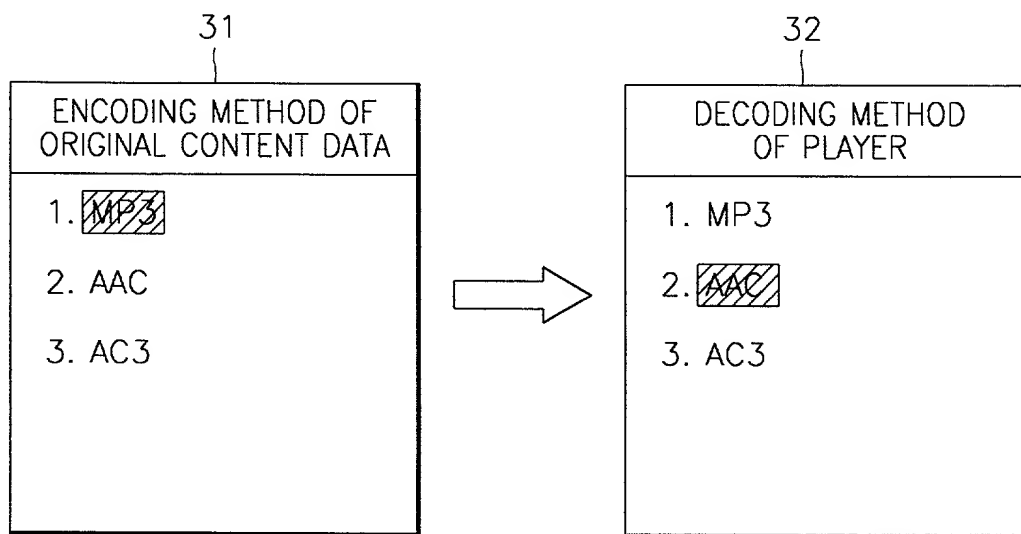


FIG. 4

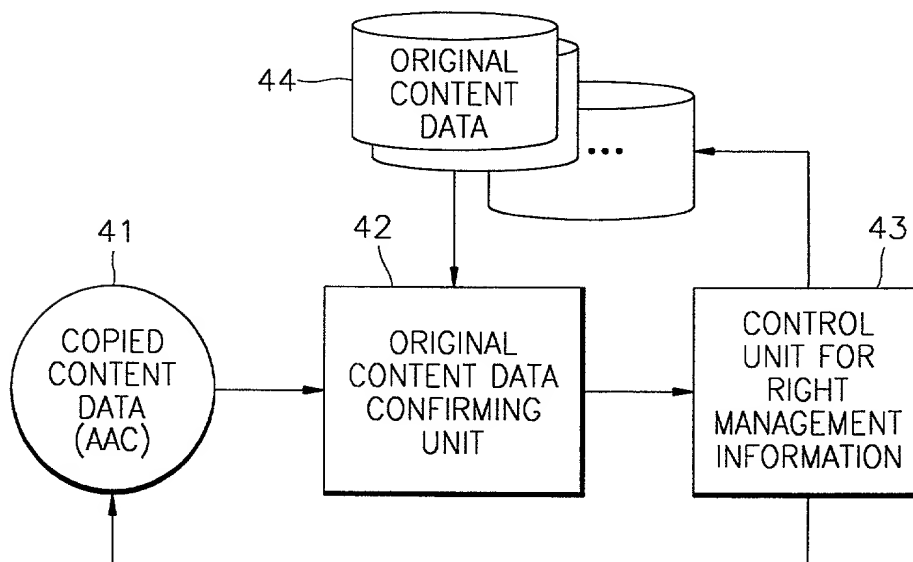


FIG. 3B

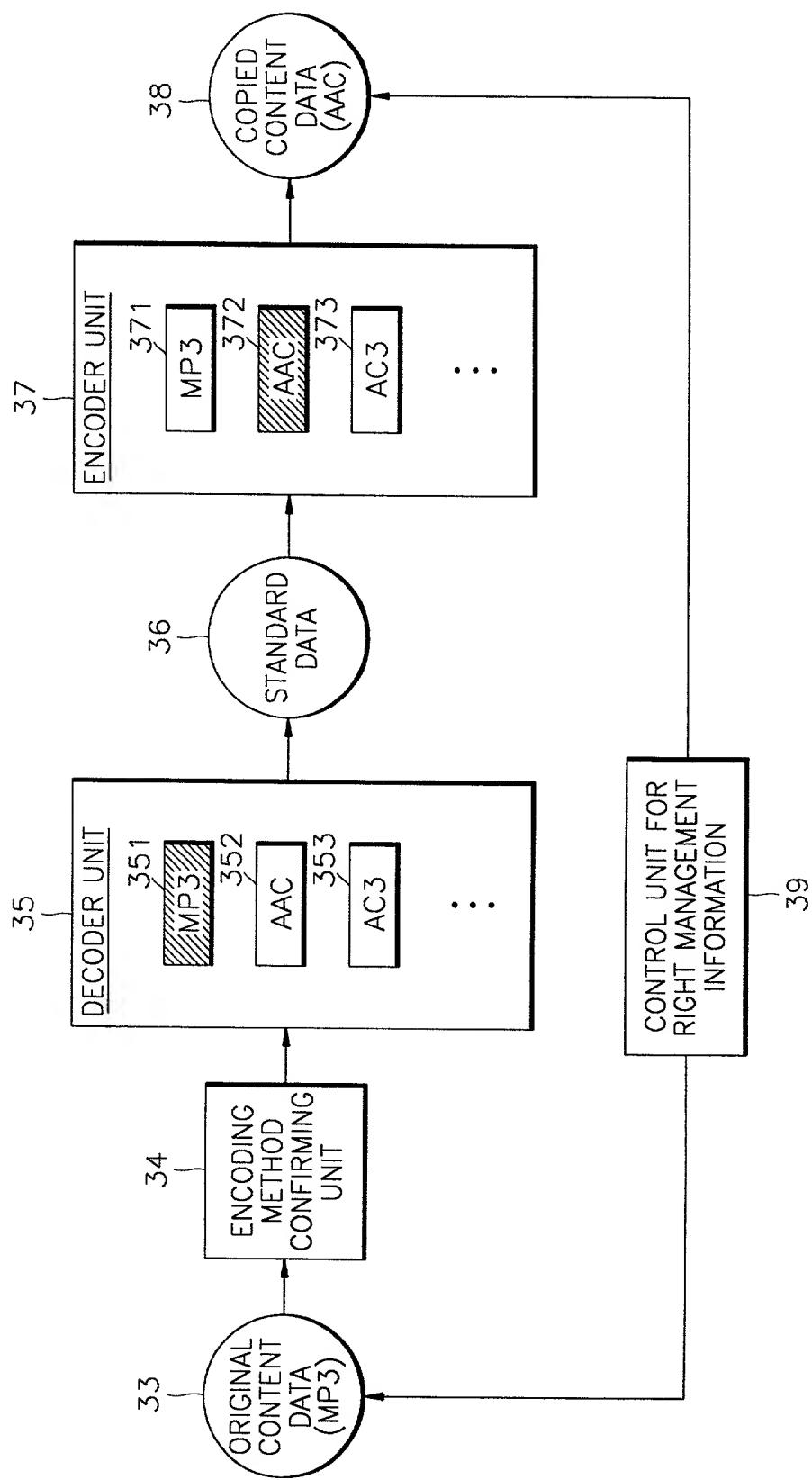


FIG. 5

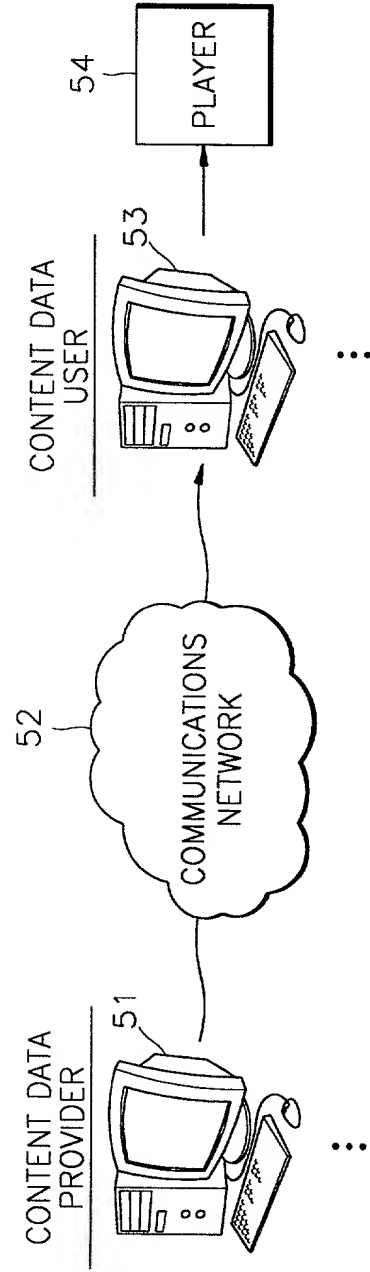


FIG. 6

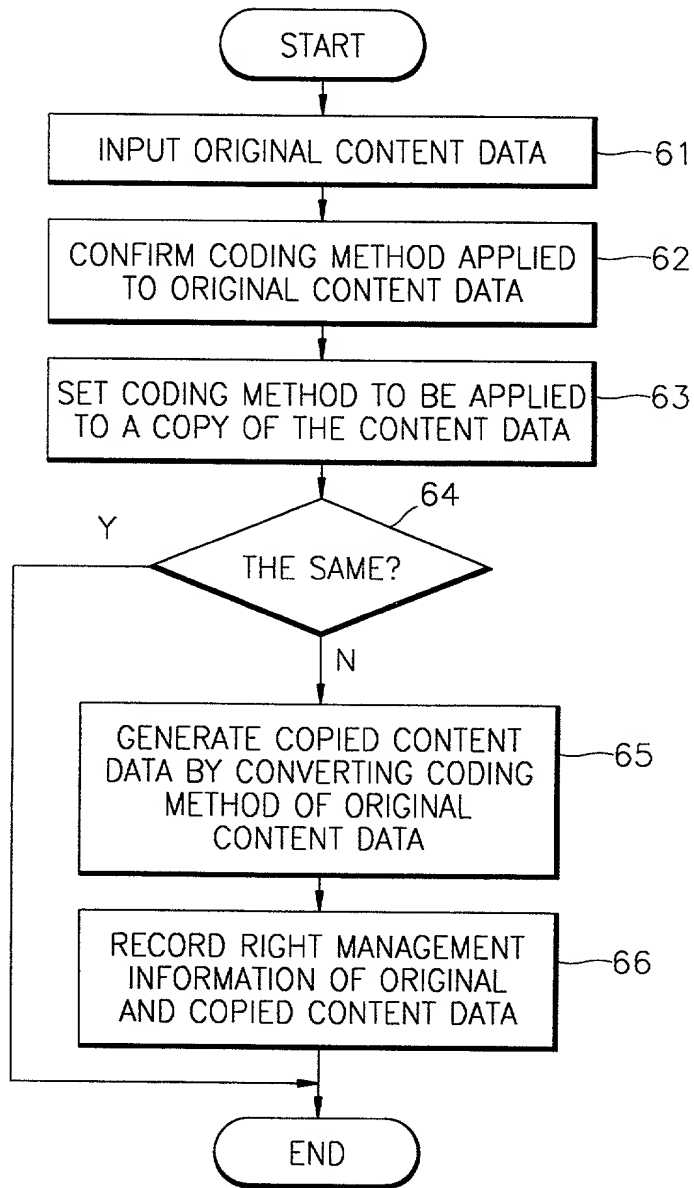


FIG. 7

